Forest fires?

Too much CO_2?

Dry stream beds?

Water scarcity?

High stream temps?

Changing hydro-graph?

Erosion?

Flooding?

“THERE’S A BEAVER FOR THAT”

- Ben Goldfarb

Nature’s Best Engineers are Allies in Climate Change Adaptation

The benefits of beavers related to climate change

Beavers are not a panacea for climate change adaptation, but they are a critical and necessary part. In addition to ecosystem, biodiversity, and salmon benefits, beavers create processes that foster climate resilience. In the Pacific Northwest, beaver ponds affect the following to varying degrees:

- Improve hydrologic conditions, through water storage, leading to increased...
  - Surface water volumes,
  - Groundwater aquifer recharge and elevated water tables, leading to...
    - Increased flow in otherwise ephemeral streams, and
    - Cooler downstream water temperatures
  - Wetland and riparian land cover, leading to...
    - Areas with wetter soils, which are natural wildfire breaks,
    - Habitat for ESA-listed salmonids and other cold-water-dependent species, and
    - Refugia for climate-change impacted migrating animals,
  - Improve water quality by capturing sediment, nutrients, and pollutants,
  - Provide in-channel complexity to mediate higher winter flows, and
  - Store carbon.

We have been saying for some time that we need to see the world through the lens of climate change. Now it’s time to approach climate change planning through the lens of the beaver.

Include beavers in your climate plans

Are you working on climate action plans, climate change mitigation plans, or climate change adaptation plans? Include beavers – the Fourth National Climate Assessment recommends it (USGCRP 2018). Here are some ways to include beavers in climate plans:

- **Support and promote acceptance and coexistence** of naturally colonizing beavers.
  - Learn about and share information on available tools to help people and beavers coexist (see King County 2018, 2019).
  - Offer tax breaks, cost sharing, and other financial incentives for use of these tools or loss of human-usable lands.
  - Educate residential and agricultural landowners about the benefits of beavers – financial and ecological (see ECONorthwest 2011; Hood et al. 2017; Pollock et al. 2003; Rosell et al. 2005; and Brown and Fouty 2011).
- **Relocate beavers** that cannot be tolerated in place (see Brick and Woodruff 2019; Dittbrenner et al. 2018; Woodruff (2014, 2015, 2016); and Section 2.6 and Appendix B in King County 2018).
- **Build Beaver Dam Analogs** to support and encourage beaver colonization (see Pollock et al. 2017).

Include beavers in your models

Climate science relies heavily on modeling and forecasting future scenarios. But models thus far are not including the potential impacts of beavers. If you are modeling:

- **water availability** for agriculture or other uses, how does it change if you add beaver ponds and higher water tables to your models? (See Callait et al. 2014; Hafen 2017; Hafen and Macfarlane 2016; Hood and Bayley 2008; Walker et al. 2010.)
- **stream temperature and hydrology**, how does the addition of more beaver ponds in the system affect your results? (See Dittbrenner 2019; Weber et al. 2017).
- **water quality**, how does the uptake of nitrogen and phosphorus of added beaver ponds change your results? (See Maret 1985; Naiman and Melillo 1984; Pollock et al. 1994.)
- **carbon budgets**, how do they change if more beavers are present across a watershed? (See Laurel and Wohl 2019, Naiman et al. 1986; Nummi et al. 2018.)
- **impacts on amphibians, birds, or other species** assemblages, how do results change if there are more beaver ponds across the landscape? (See Stevens et al. 2007; Stringer et al. 2015; Wright et al. 2002; and ongoing work by Dr. John Romansic, Washington State University.)
- **forest fires**, how does fire risk or probability change if you add more beaver activity, which affects hydrology, soil moisture, vegetation type, and possibly even presence of predator species for bark beetles, to the landscape? (See Hood and Bayley 2008; Pollock et al. 2007; Walker et al. 2010; and Whipple 2019.)

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Please see accompanying booklet for a full list of references.